AEP Mitigation Studies

Introduction

Under the terms of a Consent Decree which was prepared in 2007, American Electric Power (AEP) has provided $2 million to the National Park Service "for the restoration of land, watersheds, vegetation, and forests using adaptive management techniques designed to improve ecosystem health and mitigate harmful effects from air pollution…"

Over the past few years, park staff and staff at the National Park Service Air Resources Division have been discussing and planning for expenditure of these funds. At this stage, two types of projects are planned. These include those that stretch across a large geographic range including the three parks named in the Consent Decree (Shenandoah, Great Smoky Mountains, and Mammoth Cave) and projects that are specific to each individual park.

The largest project that is receiving support is referred to as the Applachian Trail (AT) Mega Transect Acid Deposition Study. Using the AT as a sampling transect, this project is intended to characterize a range of resource conditions (eg, soil chemistry, forest conditions and stress, water chemistry, etc.) in light of acidification and to help determine critical loads of atmospheric deposition. Shenandoah is actively participating in this study.

Consent Decree funds also support a Shenandoah specific project which is aimed at bringing together decades of water quality and aquatic biota monitoring data from multiple park and cooperator programs to better characterize park aquatic system conditions and to determine if changes need to be made in monitoring efforts. The project will also result in discussions regarding future analysis of aquatic system information particularly in the context of acidification caused by deposition and a focus on developing critical loads based on biotic sensitivities.

Management Needs

A multi-agency effort to establish critical loads (CL) of atmospheric deposition for the protection of natural ecosystems (Porter et al. 2005) is underway. Results of the Acid Deposition Study will be useful in advancing that effort. Because ecosystems vary in their sensitivity to atmospheric deposition, the most sensitive ecosystems, such as ridge tops, are of particular interest as a basis for establishing CLs to maximize protection of natural resources. Recovery of these ecosystems will likely require replenishment of the available Calcium (Ca) pool in soils. The CL for these systems could therefore be defined as the deposition level below which replenishment of ecosystem-available Ca (and Magnesium) occurs. Sampling will indicate if trees are under stress, and if soil-Ca availability is poor. If so, this would indicate that deposition levels have not decreased sufficiently to alleviate stress from Ca deficiency.

The integration and analysis of aquatic monitoring data is very important at this stage to maximize the utility of several disparate datasets and to make informed decisions regarding the future of aquatic system monitoring.

Current Procedures

The AT Mega Transect Acid Deposition Study is in the final stages (as of May 2010) of getting park approval and working out operational details. This project is quite large and involves multiple parks and other land managers as well as a large interdisciplinary scientific team. Field activities will occur in spring 2010 and 2011 and data reporting will not begin until 2012.

The Water Quality Integration and Analysis Study Plan is in final draft (as of May 2010). Park staff members are working with staff at the USGS Virginia Water Science Center on this project. Products are expected in 2011.

References

Porter, E. T., T. Blett, D. U. Potter, and C. Huber. 2005. Protecting resources on federal lands: implications of critical loads for atmospheric deposition of nitrogen and sulfur. BioScience 55:603-612.

More Information

Readers may want to refer to a companion Fact Sheet that gives more background on the AEP Consent Decree.